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10/054,094	01/22/2002	George L. Yang		3612

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GEORGE L. YANG
9105 SARACEN DRIVE
PIKESVILLE, MD 21208

EXAMINER

LE, LANA N

ART UNIT	PAPER NUMBER
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2685

DATE MAILED: 11/03/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/054,094

Applicant(s)

YANG, GEORGE L.

Examiner

Lana N Le

Art Unit

2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3, 4, 7 and 15-19 is/are rejected.
- 7) ☒ Claim(s) 1-2, 5-6, 20 is/are objected to.
- 8) ☐ Claim(s) 8-14 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (see spec. page 23-26). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 1, 3-7, and 15-20 are objected to because of the following informalities:
- In claim 1, line 3, before "amplification", "a" should be "an";
 - claim 1, line 7, "the amplified signal" should be "the digitally amplified signal";

claim 1, lines 11-12, "from digital format to analog format" should be "from the digital format into an analog format";

- claim 1, line 7, recites the limitation "the signal strength" in line 7 after "measure". There is insufficient antecedent basis for this limitation in the claim. It should be "a signal strength".

claim 3, line 2, after "device", "contains" should be "comprises";

claim 3, line 2, after "generating" "a" should be "the" from antecedent basis of claim 1, line 8;

claim 4, line 1, "The gain adjusting factor device according to claim 3" should be "The automatic gain control circuit according to claim 3";

claim 5, line 2, after "device", "contains" should be "comprises";

claim 5, line 2, after "generating", "a" should be "the" from antecedent basis of claim 1, line 8;

claim 6, line 3, after "and", "the" should be added.

claim 7, line 4, after "select", "a" should be "the" from antecedent basis of claim 1, line 8.

claim 7, line 4, after "from", "a" should be "the" from antecedent basis of claim 6, line 2.

claim 15, line 6, "the amplified signal" should be "the digitally amplified signal";

claim 15, line 8, "from digital format into analog format" should be "from the digital format into an analog format", "generate analog" should be "generate an analog";

claim 15, line 6, "the strength" after "calculating" should be "a strength";

claim 16, line 1, "said generating new gain" should be "said step of generating new gain";

claim 17, line 2, "the" after "describing" should be "a";

claim 17, line 2, "signal strength" should be "the signal strength";

claim 18, line 2, "signal strength" should be "the signal strength";

claim 18, "the" after "describing" in line 2 should be "a".

claim 19, line 1, "said generating new gain" should be "said step of generating new gain".

claim 19, lines 1-2, "the" after "based on" should be "a";

claim 20, line 2, "the" after "based on" in line 1 should be "a";

claim 20, line 1, "said generating new gain" should be "said step of generating new gain".

Appropriate correction is required.

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-7 and 15-20, drawn to automatic gain control based on signal quality measurement and gain is updated based on feedback of a digital gain control signal and a gain adjusting factor, classified in class 455, subclass 240.1.

II. Claims 8-14, drawn to automatic gain control based on stored signal strengths and stored gain values, classified in class 455, subclass 250.1.

2. Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions disclose different techniques for automatic gain control wherein the second invention is based on stored signal strengths and gain values and not based on the values from the feedback AGC loop.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

3. During a telephone conversation with Mr. George Yang on 10/01/04 a provisional election was made without traverse to prosecute invention I wherein automatic gain control is based on feedback of a digital gain control signal and a gain adjusting factor, claims 1-7 and 15-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-14 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 3-4 and 7 and 17-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- claim 3, line 2, after "contains", the limitation " means for generating a gain adjusting factor based on.....and gain adjusting factor". However, the "gain adjusting factor cannot be generated based on itself, it should be based on "a reference gain adjusting factor" (see specification, page 7, lines 1-18).

- claim 4 recites the limitation "the" in line 2 after "one from". There is insufficient antecedent basis for this limitation in the claim. "the" should be "a".

- claim 7, lines 4-5, "select a gain adjusting factor from a plurality of gain adjusting factors..." should be "select a gain adjusting factor from a plurality of reference gain adjusting factors..." (see specification; page 7, lines 22-23);

- claim 17, line 1, "said gain adjust factor generates a gain adjusting factor" itself cannot generate another "gain adjusting factor", a suggestion is "a gain adjusting factor device generates the gain adjusting factor"; and also "said gain adjusting factor" of line 1 cannot generate a gain adjusting factor based on itself (see line 3), it should be based on "a reference gain adjusting factor" (see specification, page 7, lines 1-18).

- claim 18, line 1, "said gain adjusting factor generates a gain adjusting factor" itself cannot generate another "gain adjust factor", a suggestion is "a gain adjusting factor device generates the gain adjusting factor"; and also "said gain adjusting factor"

of line 1 cannot generate a gain adjusting factor based on itself (see line 3), it should be based on "a reference gain factor" (see specification, page 7, lines 1-18).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000, Baldwin et al disclose therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 15, 16, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Baldwin et al (US 6,735,422).

Regarding claim 15, Baldwin et al disclose a method for automatically varying a gain control signal for a receiver (fig. 6 and hereafter), comprising the steps of:

a) amplifying a received signal (via BB AGC 307) according to an inherent adjustable amplification factor (in order to output signal R within a dynamic range to enable operation in the anticipated environment; col 20, lines 19-23), or the amplifier amplifies the analog gain control signal by an inherent high amplification factor that is beyond the range of the ADC 313; col 20, lines 53-56), wherein the adjustable amplification factor is determined by an analog gain control signal (analog "GAIN ADJUST" gain control signal after being converted to analog via AGC DAC 297);

b) converting (via ADC 313) the amplified signal from analog to digital format (col 20, lines 38-56; col 20, lines 16-19);

c) calculating the strength of the amplified signal (via Signal Power Estimate 315 wherein a received signal strength indicator can be used within block 315 to calculate signal strength of the amplified signal; col 21, lines 4-13);

d) generating new gain (gain signal GsubADJ to be inputted into AGC DAC 297 after the gain adjust signal is looped back through AGC loop 345 including 329, 325) based on previous gains (gain signal GsubADJ before recalculating the gain with GsubADJ being feedback via AGC loops 345 including 329 and 325) and signal strengths (signal power estimates from 315 and target/reference power from 323); and

e) converting the new gain from digital format into analog format (via AGC DAC 297) to generate analog gain control signal ("GAIN ADJUST" signal toward 307; see figure 6).

Regarding claim 16, Baldwin et al disclose the method according to claim 15, wherein the generating new gain (gain signal GsubADJ to be inputted into AGC DAC 297 after the gain adjust signal is looped back through 329, 325) updates gain (new GsubADJ signal after recalculating the gains with GsubADJ being feedback via AGC loop 345 including 329 and 325; col 19, line 54 – col 20, line 15) by multiplying (via 601) it with a gain adjusting factor (predetermined limit factor, i.e. 90% or GLIM factor; col 20, lines 4-15).

Regarding claim 19, Baldwin et al disclose the method according to claim 15, wherein the generating new gain produces gain (gain signal GsubADJ of a third AGC loop to be inputted into AGC DAC 297 after the gain adjust signal is looped back through 329, 325) based on the relation of new gain signal (GsubADJ of a third AGC loop output to 297) versus current signal strength (from signal power estimate 315 to 321 & 601) and current gain (current gain GsubACC via GsubADJ signal of a 2nd AGC loop through 329 and 325; col 19, line 54 – col 20, line 15).

Allowable Subject Matter

8. Claims 1-2, and 5-6 would be allowable if rewritten or amended to overcome claim objections set forth in this Office action.

Regarding claim 1, Baldwin et al disclose an automatic gain control circuit (fig. 6 and hereafter) comprising:

an amplifier (BB AGC amplifier 307) having at least a received signal (input from LPF block 305 which receives an adjusted received baseband signal R_{subADJ} ; see figure 6; col 14, line 61 - col 15, line 13 wherein the same received signal is inputted to the amplifier 307 as in fig. 6) and an analog gain control signal ("GAIN ADJUST" input; see figure 6; after being converted to analog via AGC converter 297) as separate inputs, wherein the amplifier (BB AGC 307) amplifies the received signal by an inherent amplification factor (in order to output signal R within a dynamic range to enable operation in the anticipated environment; col 20, lines 19-23, or the amplifier amplifies the analog gain control signal by an inherent high amplification factor that is beyond the range of the ADC 313; col 20, lines 53-56) which is controlled by the analog gain control signal (output signal "GAIN ADJUST" from AGC DAC converter 297; col 20, lines 23-26);

an analog-to-digital converter (ADC 313; col 20, lines 16-19, 38-56) configured to convert the amplified signal from analog format to digital format;

a signal strength estimator (signal power estimate block 315 wherein estimated signal power is a form of received signal strength indicator) configured to measure the signal strength of the amplified signal (col 21, lines 4-13);

and updating the new gain adjusted signal (signal directed up to AGC DAC 297 via the AGC loop 345 by readjusting the gain control signal G_{subADJ} via 329, 325); and

a digital-to-analog converter (AGC DAC 297) configured to convert a gain control signal from digital format to analog format (to output an analog gain control signal "GAIN ADJUST" to BB AGC amplifier 307; col 20, lines 23-26).

However, Baldwin and the cited prior art fail to further disclose:

a gain adjusting factor device configured to generate a gain adjusting factor;
a multiplier configured to multiply a digital gain control signal by the gain
adjusting factor.

9. Dependent claims 3-4, and 7 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph and the claim objections set forth in this action.

10. Claims 17-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, the claim objections and rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 17, Baldwin et al disclose the method according to claim 16, wherein Baldwin et al and the cited prior art fail to further disclose:

a gain adjusting factor device generates a gain adjusting factor based on a mathematics formula describing the relation between signal strength and a reference gain adjusting factor.

Regarding claim 18, Baldwin et al disclose the method according to claim 16, wherein Baldwin et al and the cited prior art fail to further disclose:

a gain adjusting factor device generates a gain adjusting factor based on a set of number pairs describing the relation between signal strength and a reference gain adjusting factor.

11. Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten to overcome to claim objection above in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 20, Baldwin et al disclose the method according to claim 15, wherein the generating new gain creates gain based on the relation of new gain (GsubADJ of 3rd AGC loop 329, 325) versus current gain (GsubACC via GsubADJ of 2nd AGC loop) and previous gains (GsubADJ of first AGC loop 329, 325).

However, Baldwin et al and the cited prior art fail to further disclose:

generating new gain is also based on previous signal strengths in addition to the above current and previous gains.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Iwata et al (US 6,708,025), Automatic gain control method and apparatus, and radio communications apparatus having automatic gain control function.

- Yamamoto (US 6,370,210), Circuitry for Generating a Gain Control Signal Applied to an AGC amplifier and Method Thereof.

- Iwata et al (US 6,577,852), Automatic Gain Control Method and Apparatus, and Radio Communications Apparatus Having Automatic Gain Control Function.

- Baldwin et al (US 6,560,448), Automatic Gain Control Method and Apparatus, and Radio Communications Apparatus having Automatic Gain Control Function.

- Cahill (US 5,083,304), Automatic Gain Control Apparatus and Method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana N Le whose telephone number is (703) 308-5836.

The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F Urban can be reached on (703) 305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Lana Le

October 18, 2004